

UNITED STATES PATENT APPLICATION

of

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for

**GOLF SHOT PRACTICE APPARATUS**

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Title Of Invention

**GOLF SHOT PRACTICE APPARATUS**

Field Of The Invention

[0001] This invention relates to a golf practice apparatus, and more particularly, to a golf practice apparatus having a tiltable platform, the tilt direction and degree of which is adjustable by the user.

Background Of The Invention

[0002] Conventional golf practice apparatus typically have a horizontal upper plate or platform with a rubber plate and artificial grass attached thereto for placing golf balls to hit for practice. Golfers utilizing such practice apparatus can practice their shots and strokes merely at a flat and horizontal surface which is different from a real golf course having a lot of lies and hills in a variety of changing directions. For example, in the golf course, the golfer may encounter a variety of different down hills, up hills, and side hills. Also, he or she may often be standing on a lie which is different from that on which the ball is positioned. Thus, even if they have practiced for an extended period of time, it's hard for them to easily adjust to real golf course terrains and improve their golf skills or scores.

[0003] As such, even though it's ideal for a golfer to practice at real golf courses, it's expensive and time consuming to practice in the actual golf course. Accordingly, it is desirable to have a golf shot practice apparatus resembling a real golf course environment with varying slopes and lies often encountered by golfers.

Summary Of The Invention

[0004] In accordance with one aspect of the present invention, a golf practice apparatus is provided, which comprises: a stance platform including an upper portion adapted to provide a standing place for a golfer; a ball platform having a golf ball positioning location thereon; a platform actuator operably coupled with the stance platform and the ball platform for providing vertical movement of the respective platform; and, a controller associated with the platform actuator for selectively providing a vertical displacement or tilting movement of the stance platform and the ball platform.

[0005] In accordance with another aspect of the present invention, a golf practice apparatus is provided, which comprises: a stance platform including an upper portion adapted to provide a standing place for a golfer; at least one stance platform actuator operably coupled with the stance platform and configured to provide a vertical displacement to at least a portion of the stance platform; a ball platform having a golf ball positioning area thereon; at least one ball platform actuator operably coupled with the ball platform and configured to provide a vertical displacement to at least a portion of the ball platform; and, a controller associated with the stance platform actuator and the ball platform actuator for selectively providing a vertical displacement or tilting movement of the respective stance platform and ball platform to various directions and degrees adjustable by the golfer.

[0006] Each of the stance platform actuator and the ball platform actuator preferably include four lifts disposed at four quadrangular locations of the respective stance platform and ball platform. Each of the stance platform and the ball platform preferably include a base member and an upper member, and the stance platform actuator and the ball platform actuator are respectively disposed between the base member and the upper member. The controller includes a user interface for enabling a golfer to control the

movement of the stance platform and the ball platform. The golf ball positioning area of the ball platform preferably includes a groove configured to place a golf practice ball thereon. The golf practice apparatus of the invention may further include a golf ball placement device configured to place or deliver a golf ball at a predetermined location of the golf practice apparatus. The golf ball placement device is preferably attached to the ball platform.

[0007] The above and other features and objectives of the present invention will become more apparent from the following detailed description considered with reference to the accompanying drawings.

#### Brief Description Of The Drawings

[0008] FIG. 1 is a perspective view illustrating an overall construction of a golf practice apparatus according to the present invention.

[0009] FIG. 2 is an exploded perspective view of one preferred embodiment of a golf practice apparatus constructed according to the present invention.

[00010] FIG. 3 is an enlarged view of portion (A) of FIG. 2.

[00011] FIG. 4 is an enlarged view of portion (B) of FIG. 2.

[00012] FIG. 5 is a perspective view illustrating one adjusted configuration of the stance platform according to the invention.

[00013] FIG. 6 is a perspective view illustrating another adjusted configuration of the stance platform according to the invention.

[00014] FIG. 7 is a perspective view illustrating one adjusted configuration of the ball platform of the invention.

[00015] FIG. 8 is a perspective view illustrating another adjusted configuration of the ball platform of the invention.

[00016] FIG. 9a is a perspective view illustrating one adjusted configuration of the stance and ball platforms of the invention, in which the stance platform lies downhill and the ball platform lies uphill.

[00017] FIG. 9b is a perspective view illustrating another adjusted configuration of the stance and ball platforms of the invention, in which the stance platform lies uphill and the ball platform lies downhill.

[00018] FIG. 9c is a perspective view illustrating another adjusted configuration of the stance and ball platforms of the invention, in which the stance platform and the ball platform both lie downhill.

[00019] FIG. 9d is a perspective view illustrating still another adjusted configuration of the stance and ball platforms of the invention, in which the stance platform and the ball platform both lie uphill.

[00020] FIGS. 10a - 10d are perspective views illustrating different arrangements of the stance and ball platforms of the invention with a variety of different lie directions.

[00021] FIG. 11 is a schematic view illustrating one embodiment of the control board of FIG. 2.

#### Detailed Description Of The Drawings

[00022] FIG. 1 shows a perspective view illustrating an overall construction of a golf practice apparatus of the present invention. The golf practice apparatus 100 of the present invention is composed essentially of a stance platform 200, a ball platform 300, at least one actuator 400 (not shown

but hidden within cover(s) 41 of the platforms 200 and 300), and a controller 500. The stance platform 200 provides an upper standing place for a golfer to practice golf shots or strokes thereon. The ball platform 300 provides a golf ball positioning area thereon.

[00023] Actuator 400 (not shown) is operatively connected to the stance platform 200 and ball platform 300 to enable vertical displacement, and/or tilting of the platforms 200 and 300. Actuator 400 may be one actuator system (not shown) having multiple actuating elements for providing such movement of the respective platform, or it can alternately be a plurality of separate actuators (such as shown in FIGS. 2-10d which will be discussed later). Controller 500 is operably coupled with the actuator(s) 400 to control such movement of the platforms 200 and 300. Other features of the golf practice apparatus of the invention will be described herein-after.

[00024] With reference to FIGS. 2-4, one preferred embodiment of the invention is described herein in details. In this embodiment, stance platform 200 and ball platform 300 of golf practice apparatus 100' have a similar structure to the golf practice apparatus 100 described above except several features to be described herein.

[00025] The stance platform 200 includes a base member 1, an upper member 10, and a supporting plate 14. The ball platform 300 similarly includes a base member 2, an upper member 11, and a supporting plate 16. The base member 1, upper member 10, and supporting member 14 of the stance platform 200 have generally similar structures to that of the base member 2, upper member 11, and supporting member 16 of the ball platform 300, respectively. The base members 1 and 2 and upper members 10 and 11 of the platforms 200 and 300 are respectively in a form of a networked frame as shown. However, they may have a different configuration such as a planar member. Also, in a certain embodiment, the base members 1 and 2 of the

platforms 200 and 300 may be omitted, and the actuators 400 (to be described later) can be placed or installed directly on the ground.

[00026] The supporting plates 14 and 16, respectively having a top mat (preferably, a green mat) 13 and 15, are attached onto the upper members or frames 10 and 11, respectively. The mat 13 and 15 preferably include artificial grass in resemblance to a real golf course condition. The supporting plate 14 provides a standing area for a golfer to practice thereon, and has a suitable strength for that. In addition, at least one ball delivery hole 32' or 33 may be provided thereon. In this embodiment, the delivery hole 33 is designed for practicing golf putting, simulating a hole in the green of a real course, and the hole 32' is for drawing out the golf ball which is received into the hole 33. For this, a ball distribution member 31 may be provided under the supporting plate 14. The ball distribution member 31 includes a delivery channel or duct 31', and a delivery hole 32 that is connected to the hole 32' for extracting of the ball as discussed above. Alternatively, the delivery duct 31' may be further extended and connected to a location other than the hole 32', for example, to discharge the holed-in ball at a desired location outside of the golf practice apparatus or to deliver the ball back to a golf ball placement device (to be discussed later). With such an alternative design, the delivery hole 32' on the supporting plate 14 is not required.

[00027] On the other hand, the other supporting plate 16 of the ball platform 300 provides an area adapted for positioning of a golf practice ball to practice golf shots by iron and driver clubs, and preferably includes at least one groove 17 at a suitable location. Upon provision of a suitably-configured groove 17 thereon, the ball positioned on the plate 16 can be maintained its desired location to hit by the golfer without falling down there-from. This is useful particularly when the ball platform 300 is tilted as will be described later in connection with operation of the apparatus. Artificial grass having a plurality of groove patterns specially designed to hold the balls upon tilting,

may be placed on the region 17. In addition to the groove region 17 (or instead of providing such a groove region 17), the supporting plate 16 of the ball platform 300 may include a tee member (not shown) suitably configured and positioned at an appropriate location thereof. A flexible and durable practice tee known in the art may be utilized for that. However, it is noted that an upper ball-contact area of the tee must provide a wider seating surface to prevent the ball from falling-off the tee when the ball platform 300 is tilted as described herein after.

[00028] It is further noted that the supporting plates 14 and 16 can be unitarily formed with the respective upper members 10 and 11 when an additional device such as the ball distribution member 31 is not provided between the supporting plates 14 and 16 and the upper members 10 and 11.

[00029] In the present embodiment, four actuators 3, 3', 4 and 4', and four similar actuators 5, 5', 6 and 6' are respectively mounted on the base members 1 and 2 about the four corners thereof as shown in the FIG. 2. Such actuators are preferably in the form of a screw lift driven by a motor 60 (details shown in FIGS. 3 and 4). Other types of known actuators such as pneumatic/hydraulic cylinders or electric actuators may alternatively used for the four actuators. In a certain other embodiment, such four actuators can be replaced with two actuators, each having two actuating arms particularly designed to support and move two corners of the respective platform.

[00030] With reference still to FIGS. 2-4, each of the screw lifts includes an elongated screw 61, and at least one set of four link arms 62 operably connected to the motor 60 and screw 61. As shown, it is preferable to have a pair of (i.e., two sets of) four links 62, each set forming a parallelogram shape, and being in parallel disposition to one another and laterally connected by a suitable structure. As shown, two gears 29 can be provided in engagement with each other at two lower links 62 for facilitating



vertical movement of the screw lift. Each of the actuators (e.g., screw lifts) includes a bracket plate 8 affixed to a bracket member 7 which is in turn mounted to the link structure 62. The bracket plate 8 and bracket member 7 can alternatively be formed unitarily. Each screw lift further includes a separate bracket 12 which is to be attached to the upper frame 10 or 11 of the respective platform. The bracket 8 and 12 respectively include a central groove at opposing inner faces, and a spring 9 is inserted within the grooves of the bracket plates 8 and 12. The spring 9 has a suitable size and strength to fit within the grooves and sufficiently support and oppose the two bracket plates 8 and 12 under a loaded condition in actual use of the golf practice apparatus.

[00031] With reference to FIGS. 1 and 2, the controller 500 is provided, which is connected by a cable 42 to the respective stance and ball platform actuators (such as 3, 3', 4, 4', 5, 5', 6, 6') to control movement of the respective platforms 200 and 300 of the golf practice apparatus of the invention. The controller 500 includes a tilt/displacement controller 20 with a user interface panel 19 to operate the golf practice apparatus.

[00032] One illustrative embodiment of the user interface panel 19 is described with reference to FIG. 11, which includes a plurality of control buttons for controlling movement of the respective platforms 200 and 300. Power button 22 is to turn the apparatus 100 on or off. A ball platform selection button 23 is to select operation of the ball platform 300, and a stance platform selection button 23 is to select operation of the stance platform 200. A plurality of movement buttons 25 are also provided to provide vertical displacement and/or tilting movements of the respective platform 200 and/or 300. In this embodiment, movement buttons 25-1 and 25'-1 are for operating two left actuators (3 and 3', or 5 and 5') up and down, respectively, which result in the left side of the respective platform 200 or 300 moving up and down, respectively. The terms of "left", "right", "front", and "rear" used in this

invention description in connection with the direction of the platforms 200 and 300, and their associated actuators, are meant to be the particular directions perceived by the golfer who is standing on the platform in a proper alignment to hit a golf ball thereon, i.e., facing toward of the ball area 17. Movement buttons 25-2 and 25'-2 are for operating two front actuators (3' and 4', or 5' and 6') up and down, respectively, which result in the front side of the respective platform 200 or 300 moving up and down, respectively. Likewise, movement buttons 25-3 and 25'-3 are for operating two right actuators (4 and 4', or 6 and 6') up and down, respectively, which result in the right side of the respective platform 200 or 300 moving up and down, respectively. Likewise, movement buttons 25-4 and 25'-4 are for operating two rear actuators (3 and 4, or 5 and 6) up and down, respectively, which result in the rear side of the respective platform 200 or 300 moving up and down, respectively. A reset button 26 is also provided to make the respective platform 200 or 300 return to the initial horizontal state. Other suitable configurations of the user interface panel may be contemplated. For example, instead of assigning two actuators to a particular movement button as discussed above, respective one actuator may be assigned to one corresponding movement button. In this arrangement, pressing one button causes movement of its corresponding one actuator, and thus, it requires pressing of two buttons at the same time in order to move a side of the respective platform. Further control elements may also be included in the interface panel 19 for adequate operation of the golf practice apparatus of the invention.

[00033] The controller 500 may further include or couple with a golf ball placement equipment 18 to hold a multitude of golf practice balls therein and automatically place the balls, one at a time, at an appropriate location on the mat 15 (or mat 13) of the golf practice apparatus. A conventional golf ball placement device may be modified and combined with the controller 500. The golf ball placement equipment 18 includes, among other known mechanisms, an extended oscillator arm (not shown) which picks up a ball stored within the

equipment, and travels back and forth through a horizontal slot 18a for placing at a predetermined location, preferably, on the groove 17. As shown in FIG. 1, a suitable pedal or activation button 43 is provided at a convenient location either on the ball platform 300 or the stance platform 200 to activate placement of the balls by the ball placement equipment 18. The golfer can press the activation button 43 either by a foot or a golf club held by the person. The activation button 43 is connected to the controller 500 for the operation.

[00034] As shown, it is preferred to have the controller 500 (which is combined with the ball placement equipment 18) attached at a distal end side of the ball platform 300. This design is intended to provide a convenient access to the controller 500 and also for precise positioning of the ball on a particular location in the mat 15.

[00035] With reference to FIG. 2, the apparatus of the invention may optionally include a control module 21 which is connected to the controller 500 via a cable 42. The module 21 preferably includes a plurality of indicators and/or adjusting elements for the operation control of the golf practice apparatus. It is advantageous to provide a step member 30 (FIG. 1) having a suitable size and shape to facilitate the golf to step on and access onto the standing area of the platforms 200 and 300. The module 21 may be received within the enclosure of the step 30.

[00036] With reference to FIGS. 2-8, and 11, operation of the golf practice apparatus of the present invention is described herein. Here, the golf practice apparatus 100' which has four actuators at four corners of the respective platforms 200 and 300 (i.e., that shown in FIG. 2), is particularly used for description herein for purposes of simplicity and clarity. However, the operation methods of the invention are not intended to be limited thereto, and a golf practice apparatus with different structures (such as that having different actuators described above in this invention disclosure) may be used.

[00037] Referring to FIGS. 2-8, the stance platform 200 and the ball platform 300 of the golf practice apparatus 100' are initially set to maintain a horizontally balanced configuration. Golfers may from time to time practice golf with the apparatus 100 set in this state. When the golfer wants to move or adjust the orientation of the particular platform(s) 200 and/or 300, the person may raise or lower at least a portion of the selected platform by manipulating the user interface panel 19 of the controller 500.

[00038] As illustrated and described in connection with FIG. 11, the user interface panel 19 basically includes a plurality of control elements or buttons, for example, power button 22, ball platform operation selection button 23, stance platform operation selection button 24, movement buttons 25, and reset button 26. For the operation, these buttons can be pressed in series either by a hand, a foot, or a golf club of the golfer.

[00039] Referring to FIGS. 5, 6 and 11, illustrative operation of the stance platform 200 is described herein. The power button 22 is first turned on. Then, the stance platform selection button 24 is pressed to make the controller 500 ready to control the desired operation of the stance platform 200.

[00040] As shown in FIG. 5 (in association with FIG. 2), in order to move the left side of the stance platform 200 up, the movement button 25-1 is pressed. This causes two left actuators 3 and 3' to operate upwards (as described before) and the left side of the stance platform 200 moves up. The golfer stops pressing the button 25-1 when the desired tilting degree is reached. It is preferred that the apparatus 100 further includes at its appropriate location an indicator (not shown) for displaying the adjusted tilt directions and degrees. Contrarily, in order to move the left side of the stance platform 200 back to downwards, the movement button 25'-1 is pressed.

[00041] As described before, each of the actuators preferably includes spring 9 received within opposing central grooves of two corresponding bracket members 8 and 12 (as shown FIG. 3). These (four) springs 9 can support the weight of the respective platform 200 or 300 and the golfer while providing a small gap between respective two opposing faces of the bracket members 8 and 12. When only one side of the respective platform is moved up or down (i.e., tilted) as described herein, each of the four springs 9 is bent or twisted between the bracket members 8 and 12 (as shown in FIGS. 9a – 9d), and the four springs 9 can still support the weight of the respective platform 200 or 300 and the golfer, while the gap between the respective two opposing faces of the bracket members 8 and 12 is changed to a wedge-like shape for adapting to the tilted platforms. This spring-bracket combination structure of the invention is advantageous because it facilitate the respective platforms to be in a balanced and secured state even after they are tilted.

[00042] As shown in FIG. 6, in order to move the right side of the stance platform 200 up, the movement button 25-3 is pressed. This causes two right actuators 4 and 4' to operate upwards (as described before) and the right side of the stance platform 200 moves up. The golfer stops pressing the button 25-1 when the desired tilting degree is reached, preferable with the aid of the tilt indicator as described above. Contrarily, in order to move the right side of the stance platform 200 back to downwards, the movement button 25'-3 is pressed.

[00043] Likewise, other tilt orientations (e.g., front side up or down, rear side up or down, etc.) of the stance platform 200 can be conveniently obtained by appropriate manipulation of the movement buttons 25. In order to change a different tilt orientation from the current one, it is sometimes useful to return the prior adjusted configuration to the initial (i.e., horizontal) state by pressing the reset button 26. Whenever the golfer wants to make the selected platform into the horizontal state, the reset button 26 can be pressed.

[00044] With reference now to FIGS. 7, 8 and 11, illustrative operation of the ball platform 300 is described herein. First the power button 22 must be in the on position. Then, the ball platform selection button 23 is pressed to make the controller 500 ready to control the desired operation of the ball platform 300.

[00045] As shown in FIG. 7 (in association with FIG. 2), in order to move the left side of the ball platform 300 up, the movement button 25-1 is pressed. This causes two left actuators 5 and 5' to operate upwards (as described before) and the left side of the ball platform 300 moves up. The golfer stops pressing the button 25-1 when the desired tilting degree is reached, preferable with the aid of the tilt indicator as described above. Contrarily, in order to move the left side of the ball platform 300 back to downwards, the movement button 25'-1 is pressed.

[00046] As shown in FIG. 8 (in association with FIG. 2), in order to move the right side of the ball platform 300 up, the movement button 25-3 is pressed. This causes two right actuators 6 and 6' to operate upwards (as described before) and the right side of the ball platform 300 moves up. The golfer stops pressing the button 25-3 when the desired tilting degree is reached, preferable with the aid of the tilt indicator as described above. Contrarily, in order to move the right side of the ball platform 300 back to downwards, the movement button 25'-3 is pressed.

[00047] Accordingly, the above mentioned and other tilt orientations (e.g., front side up or down, rear side up or down, etc.) of the selected platform 200 or 300 can be easily obtained by appropriate manipulation of the movement buttons 25. Also, the reset button 26 can be pressed when it is desired to make the respective platform 200 or 300 into the horizontal state. It is further noted that the respective platform 200 and/or 300 can be elevated and lowered while maintaining its horizontal state by pressing appropriate

buttons. For example, two movement buttons 25-1 and 25-3 (or, 25-2 and 25-4) can be pressed to elevate the height of the selected platform 200 or 300.

[00048] FIGS. 9a – 9d show various, exemplary tilt configurations of the golf practice apparatus adjusted in accordance with the principles of the present invention. FIGS. 10a – 10d show further tilt configurations of the stance and ball platforms 200 and 300 of the golf practice apparatus according to the present invention.

[00049] As such, each of the stance and ball platforms 200 and 300 can be adjusted to a variety of different configurations by manipulation of the buttons 22, 23, 24, 25, and 26. Now, when the golfer presses the ball placement button 43 (FIG. 1), the golf ball placement equipment 18 automatically pick up one practice ball 28 (FIGS. 7-8) and place on the groove 17 of the ball platform 300 or on a predetermined location of the apparatus 100 for enabling the golfer to practice thereon. As described above, having the golf ball placement equipment 18 affixed at the front side of the ball platform 300, the ball 28 can be positioned at a precise location even the ball platform 300 is tilted.

[00050] Accordingly, golfers can repeatedly practice golf shots with the golf practice apparatus of the invention in various different lie conditions resembling to the real golf course terrains. In addition, utilizing the holes 32' and 33 on the stance platform 200, the golf can also practice golf putting skills thereon.

[00051] While this invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form, structures, methods, mechanisms and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.